DIVERSITY RECEIVER FRONT END SYSTEM WITH POST-AMPLIFIER FILTERS

CROSS-REFERENCE TO RELATED APPLICATION(S)

[0001] This application claims priority to U.S. Provisional Application No. 62/073,043 filed October 31, 2014, entitled DIVERSITY RECEIVER FRONT END SYSTEM, U.S. Provisional Application No. 62/077,894, filed November 10, 2014, entitled DIVERSITY RECEIVER ARCHITECTURE HAVING PRE AND POST LNA FILTERS FOR SUPPORTING CARRIER AGGREGATION, U.S. Application No. 14/727,739, filed June 1, 2015, entitled DIVERSITY FRONT END SYSTEM WITH VARIABLE-GAIN AMPLIFIERS, and U.S. Application No. 14/735,482, filed June 10, 2015, entitled DIVERSITY RECEIVER FRONT END SYSTEM WITH POST-AMPLIFIER FILTERS, the disclosure of each of which is hereby expressly incorporated by reference herein in its entirety.

BACKGROUND

Field

[0002] The present disclosure generally relates to wireless communication systems having one or more diversity receiving antennas.

Description of the Related Art

[0003] In wireless communication applications, size, cost, and performance are examples of factors that can be important for a given product. For example, to increase performance, wireless components such as a diversity receive antenna and associated circuitry are becoming more popular.

[0004] In many radio-frequency (RF) applications, a diversity receive antenna is placed physically far from a primary antenna. When both antennas are used at once, a transceiver can process signals from both antennas in order to increase data throughput.

SUMMARY

[0005] In accordance with there is provided a receiving system comprising:

a controller configured to selectively activate one or more of a plurality of paths between an input of a first multiplexer and an output of a second multiplexer;

a plurality of amplifiers, each one of the plurality of amplifiers disposed along a corresponding one of the plurality of paths and configured to amplify a signal received at the amplifier; and

a first plurality of bandpass filters, each one of the first plurality of bandpass filters disposed along a corresponding one of the plurality of paths at an output of a corresponding one of the plurality of amplifiers and configured to filter a signal received at the bandpass filter to a respective frequency band.

[0005A] In accordance with the present disclosure, there is also provided a radio-frequency (RF) module comprising:

a packaging substrate configured to receive a plurality of components; and

a receiving system implemented on the packaging substrate, the receiving system including a controller configured to selectively activate one or more of a plurality of paths between an input of a first multiplexer and an output of a second multiplexer, a plurality of amplifiers, each one of the plurality of amplifiers disposed along a corresponding one of the plurality of paths and configured to amplify a signal received at the amplifier, and a first plurality of bandpass filters, each one of the first plurality of bandpass filters disposed along a corresponding one of the plurality of paths at an output of a corresponding one of the plurality of amplifiers and configured to filter a signal received at the bandpass filter to a respective frequency band.

[0005B] In accordance with the present disclosure, there is further provided a wireless device comprising:

a first antenna configured to receive a first radio-frequency (RF) signal;

a first front-end module (FEM) in communication with the first antenna, the first FEM including a packaging substrate configured to receive a plurality of components, the first FEM further including a receiving system implemented on the packaging substrate, the receiving

system including a controller configured to selectively activate one or more of a plurality of paths between an input of a first multiplexer and an output of a second multiplexer, a plurality of amplifiers, each one of the plurality of amplifiers disposed along a corresponding one of the plurality of paths and configured to amplify a signal received at the amplifier, and a first plurality of bandpass filters, each one of the first plurality of bandpass filters disposed along a corresponding one of the plurality of paths at an output of a corresponding one of the plurality of amplifiers and configured to filter a signal received at the bandpass filter to a respective frequency band; and

a communications module configured to receive a processed version of the first RF signal from the output via a transmission line and generate data bits based on the processed version of the first RF signal.

[0005C] In some implementations, the present disclosure relates to a receiving system including a controller configured to